SPYWOLF

Security Audit Report

Audit prepared for

Chain Factory

Completed on

January 03, 2024

OVERVIEW

This goal of this report is to review the main aspects of the project to help investors make an informative decision during their research process.

You will find a a summarized review of the following key points:

- ✔ Contract's source code
- ✔ Owners' wallets
- ✔ Tokenomics
- ✔ Team transparency and goals
- ✔ Website's age, code, security and UX
- ✔ Whitepaper and roadmap
- ✔ Social media & online presence

The results of this audit are purely based on the team’s evaluation and does not guarantee nor reflect the projects outcome and goal

- SPYWOLF Team -

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CHAIN FACTORY

PROJECT DESCRIPTION

"With ChainFactory, users can choose from a variety of customizable templates and features, making it simple to create contracts tailored to your specific needs. It is designed to be user-friendly and intuitive, guiding users through the entire process step-by-step, providing a centralized platform to create, deploy, and manage your Smart-Contracts with ease."

Release Date: Launching in 2024

Category: Ecosystem

MAIN TOKEN CONTRACT

Token Name
ChainFactory

Symbol
FACTORY

Contract Address
0x0bF2Fed436AE9747Eec4f30f844cE9743bEC37eA

Network
Ethereum Sepolia TESTNET

Language
Solidity

Deployment Date
Jan 02, 2024

Contract Type
Token with taxes

Total Supply
75,000,000

Status
Launched

TAXES

Buy Tax
8.5%

Sell Tax
9%

*Taxes can be changed in future

Our Contract Review Process

The contract review process pays special attention to the following:

- Testing the smart contracts against both common and uncommon vulnerabilities
- Assessing the codebase to ensure compliance with current best practices and industry standards.
- Ensuring contract logic meets the specifications and intentions of the client.
- Cross referencing contract structure and implementation against similar smart contracts produced by industry leaders.
- Thorough line-by-line manual review of the entire codebase by industry experts.

Blockchain security tools used:

- OpenZeppelin
- Mythril
- Solidity Compiler
- Hardhat

TOKEN TRANSFERS STATS

Transfer Count	TESTNET
Uniq Senders	TESTNET
Uniq Receivers	TESTNET
Total Amount	TESTNET
Median Transfer Amount	TESTNET
Average Transfer Amount	TESTNET
First transfer date	TESTNET
Last transfer date	TESTNET
Days token transferred	TESTNET

SMART CONTRACT STATS

Calls Count	TESTNET
External calls	TESTNET
Internal calls	TESTNET
Transactions count	TESTNET
Uniq Callers	TESTNET
Days contract called	TESTNET
Last transaction time	TESTNET
Created	TESTNET
Create TX	TESTNET
Creator	TESTNET

FEATURED WALLETS

Owner address	0xBA799d418D1356ff5d225096d08951a3b45b6e4A
Marketing fee receivers	0xBA799d418D1356ff5d225096d08951a3b45b6e4A 0x6CBa0da9bF86076dC9Ce68082C57E1D0cE0FcF35
LP address	0x3D250979FF422D2299e3BD148e744d5e4a68EA9e

TOP 3 UNLOCKED WALLETS

N/A	TESTNET
N/A	TESTNET
N/A	TESTNET

VULNERABILITY ANALYSIS

ID	Title	
SWC-100	Function Default Visibility	**Passed**
SWC-101	Integer Overflow and Underflow	**Passed**
SWC-102	Outdated Compiler Version	**Passed**
SWC-103	Floating Pragma	**Passed**
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SWC-134	Message call with hardcoded gas amount	Passed
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SWC-136	Unencrypted Private Data On-Chain	Passed

MANUAL
CODE REVIEW

When performing smart contract audits, our specialists look for known vulnerabilities as well as logical and access control issues within the code. The exploitation of these issues by malicious actors may cause serious financial damage to projects that failed to get an audit in time.

We categorize these vulnerabilities by 4 different threat levels.

THREAT LEVELS

High Risk

Issues on this level are critical to the smart contract's performance/functionality and should be fixed before moving to a live environment.

Medium Risk

Issues on this level are critical to the smart contract's performance, functionality and should be fixed before moving to a live environment.

Low Risk

Issues on this level are minor details and warning that can remain unfixed.

Informational

Information level is to offer suggestions for improvement of efficacy or security for features with a risk free factor.

FOUND THREATS

⚠ High Risk

Owner can blacklist address until blacklisting functionality is renounced. Blacklisted addresses are unable to sell tokens.

```
function blacklist(address account, bool status) public onlyOwner {
    _blacklist(account, status);
}

function _blacklist(address account, bool status) internal {
    require(!_renounced.Blacklist);
    require(account != _owner && account != address(0) && account != address(0xdEaD));
    require(account != _dex.router && account != _dex.pair, "DEX router or pair");

    if (status) { require(!_whitelisted[account], "Whitelisted"); }

    _blacklisted[account] = status;

    emit Blacklisted(account, status);
}

function blacklist(address[] calldata accounts, bool status) external onlyOwner {
    unchecked {
      uint256 cnt = accounts.length;

      for (uint256 i; i < cnt; i++) { _blacklist(accounts[i], status); }
    }
}

function renounceBlacklist() external onlyOwner {
    _renounced.Blacklist = true;

    emit RenouncedBlacklist();
}
```

- Recommendation:
  - Blacklisting addresses should be automated (bot protection) with reasonable boundaries (blocks, seconds, etc.).

FOUND THREATS

⚠ Medium Risk

Owner can change reflections token.
If router or similar contract is set as reflection token, contract will halt on sell once it reaches the autoswap amount.

```
function _setReflection(address token) internal {
    require(token == address(0) || token == address(this) || token == _dex.WSepoliaETH ||
    IDEXFactoryV2(IDEXRouterV2(_dex.router).factory()).getPair(_dex.WSepoliaETH, token) != address(0), "No Pair");

    _reflectionToken = IERC20(token == address(0) ? address(this) : token);
}
```

- Recommendation:
  - Only token contracts that can be traded in DEX should be set as reflection token.

FOUND THREATS

Informational

Owner can set buy/sell/transfer taxes up to 25%, until the functionality is renounced.
Combined buy+sell = 25%.
Owner can change taxes receiving wallets.
When taxes are above 0, there will be certain amount of tokens that will be deducted from every transaction that users make. Deducted amount will be as much as the taxes % from total amount that user had bought, sold and/or transferred.

```
function setTaxBeneficiary(uint8 slot, address account, uint24[3] memory percent, uint24[3] memory penalty) external onlyOwner {
    require(!_renounced.Taxable);

    _setTaxBeneficiary(slot, account, percent, penalty);
}

function _setTaxBeneficiary(uint8 slot, address account, uint24[3] memory percent, uint24[3] memory penalty) internal {
    require(slot < 5);
    require(account != address(this) && account != address(0));

    taxBeneficiary storage _taxBeneficiary = _taxBeneficiary[slot];

    if (account == address(0xdEaD) && _taxBeneficiary.exists && _taxBeneficiary.unclaimed > 0) { revert("Unclaimed taxes"); }

    unchecked {
      _totalTxTax += percent[0] - _taxBeneficiary.percent[0];
      _totalBuyTax += percent[1] - _taxBeneficiary.percent[1];
      _totalSellTax += percent[2] - _taxBeneficiary.percent[2];
      _totalPenaltyTxTax += penalty[0] - _taxBeneficiary.penalty[0];
      _totalPenaltyBuyTax += penalty[1] - _taxBeneficiary.penalty[1];
      _totalPenaltySellTax += penalty[2] - _taxBeneficiary.penalty[2];

      require(_totalTxTax <= 25 * _denominator &&
       ((_totalBuyTax <= 25 * _denominator && _totalSellTax <= 25 * _denominator) &&
       (_totalBuyTax + _totalSellTax <= 25 * _denominator)), "High Tax");
      require(_totalPenaltyTxTax <= 25 * _denominator &&
       ((_totalPenaltyBuyTax <= 25 * _denominator && _totalPenaltySellTax <= 25 * _denominator) &&
       (_totalPenaltyBuyTax + _totalPenaltySellTax <= 25 * _denominator)), "High Penalty");
    }

    _taxBeneficiary.account = account;
    _taxBeneficiary.percent = percent;
    _taxBeneficiary.penalty = penalty;

    if (!_taxBeneficiary.exists) { _taxBeneficiary.exists = true; }

    emit SetTaxBeneficiary(slot, account, percent, penalty);
}
```

FOUND THREATS

Informational

Owner can set buy/sell/transfer adaptive taxes up to 25%, until the functionality is renounced.
Combined buy+sell = 25%.
Adaptive taxes will be applied when the amount transferred is higher than the current adaptive tax threshold.

```
function setAdaptiveTax(uint8 level, uint256 threshold, uint24[3] memory multiplier) external onlyOwner {
    require(!_renounced.Taxable);
    require(level < 5);

    _setAdaptiveTax(level, threshold, multiplier);
}

function _setAdaptiveTax(uint8 level, uint256 threshold, uint24[3] memory multiplier) internal {
    require(multiplier[0] >= _denominator && multiplier[1] >= _denominator && multiplier[2] >= _denominator);

    unchecked {
      uint256 _totalAdaptiveTxTax = (_totalTxTax * multiplier[0]) / _denominator;
      uint256 _totalAdaptiveBuyTax = (_totalBuyTax * multiplier[1]) / _denominator;
      uint256 _totalAdaptiveSellTax = (_totalSellTax * multiplier[2]) / _denominator;

      require(_totalAdaptiveTxTax <= 25 * _denominator &&
      ((_totalAdaptiveBuyTax <= 25 * _denominator && _totalAdaptiveSellTax <= 25 * _denominator)
      && (_totalAdaptiveBuyTax + _totalAdaptiveSellTax  <= 25 * _denominator)), "High Multiplier");

      if (level + 1 < 5 && _adaptiveTax[level + 1].exists) { require(_adaptiveTax[level + 1].threshold > threshold); }
      if (level - 1 >= 0 && _adaptiveTax[level - 1].exists) { require(_adaptiveTax[level - 1].threshold < threshold); }
    }

    if (!_adaptiveTax[level].exists) { _adaptiveTax[level].exists = true; }

    _adaptiveTax[level].threshold = threshold;
    _adaptiveTax[level].multiplier = multiplier;

    emit SetAdaptiveTax(level, threshold, multiplier);
}
```

FOUND THREATS

Informational

**Owner can withdraw any tokens from the contract.
When this function is present, in cases tokens are sent into the contract by mistake or purposefully, contract's owner can retrieve them.**

```
function recoverERC20(address token, address to, uint256 amount) external onlyOwner {
    unchecked {
      uint256 balance = IERC20(token).balanceOf(address(this));
      uint256 allocated = token == address(this) ? _amountForTaxDistribution +
      _amountForLiquidity : (address(_reflectionToken) == token ? _reflectionTokensForTaxDistribution : 0);

      require(balance - (allocated >= balance ? balance : allocated) >= amount, "Exceeds balance");
    }

    IERC20(token).transfer(to, amount);
}


function recoverSepoliaETH(address payable to, uint256 amount) external onlyOwner {
    unchecked {
      uint256 balance = address(this).balance;
      uint256 allocated = address(_reflectionToken) == _dex.WSepoliaETH ? _ethForTaxDistribution : 0;

      require(balance - (allocated >= balance ? balance : allocated) >= amount, "Exceeds balance");
    }

    (bool success, ) = to.call{ value: amount }("");

    require(success);
}
```

FOUND THREATS

Informational

Owner can set max transaction amount that address can transfer until the functionality is renounced, but can't lower it than 0.1% of total supply.

```
function setMaxTxPercent(uint24 percent) external onlyOwner {
    require(!_renounced.MaxTx);

    unchecked {
      require(percent == 0 || (percent >= 100 && percent <= 100 * _denominator));
    }

    _setMaxTxPercent(percent);

    emit SetMaxTxPercent(percent);
}

function _setMaxTxPercent(uint24 percent) internal {
    _maxTxPercent = percent;
    _maxTxAmount = percent > 0 ? _percentage(_totalSupply, uint256(percent)) : 0;

    if (!_initialized) { emit SetMaxTxPercent(percent); }
}

function _percentage(uint256 amount, uint256 bps) internal pure returns (uint256) {
    unchecked {
      return (amount * bps) / (100 * uint256(_denominator));
    }
}
```

FOUND THREATS

Informational

Owner can set max balance (max wallet) that address can hold as low as 0.1% of total supply, until the functionality is renounced.

```
function setMaxBalancePercent(uint24 percent) external onlyOwner {
    require(!_renounced.MaxBalance);

    unchecked {
      require(percent == 0 || (percent >= 100 && percent <= 100 * _denominator));
    }

    _setMaxBalancePercent(percent);

    emit SetMaxBalancePercent(percent);
}

function _setMaxBalancePercent(uint24 percent) internal {
    _maxBalancePercent = percent;
    _maxBalanceAmount = percent > 0 ? _percentage(_totalSupply, uint256(percent)) : 0;

    if (!_initialized) { emit SetMaxBalancePercent(percent); }
}

function _percentage(uint256 amount, uint256 bps) internal pure returns (uint256) {
    unchecked {
      return (amount * bps) / (100 * uint256(_denominator));
    }
}
```

FOUND THREATS

Informational

Owner can set penalty time for sells up to 1 hour from trading start timestamp.
If holders sell their tokens before the time set, they will be subject to penalty taxes.

```
function setEarlyPenaltyTime(uint32 time) external onlyOwner {
    require(!_renounced.Taxable);
    require(time <= 1 hours);

    _setEarlyPenaltyTime(time);
}

function _setEarlyPenaltyTime(uint32 time) internal {
    _earlyPenaltyTime = time;

    emit SetEarlyPenaltyTime(time);
}
```

Owner can set cooldown between trades if more than 2 txs are done by user for period of time.
Cooldown period can be up to 1 week.

```
function setCooldown(uint8 count, uint32 time, uint32 period) external onlyOwner {
    require(!_renounced.Cooldown);

    _setCooldown(count, time, period);
}

function _setCooldown(uint8 count, uint32 time, uint32 period) internal {
    require(count > 1 && time > 5 && period <= 1 weeks);

    _cooldownTriggerCount = count;
    _cooldownTriggerTime = time;
    _cooldownPeriod = period;

    emit SetCooldown(count, time, period);
}
```

FOUND THREATS

Informational

Users can gain token spend approval from address if they have the required signature.

```
function permit(address owner, address spender, uint256 value,
uint256 deadline, uint8 v, bytes32 r, bytes32 s) external {
    require(deadline >= block.timestamp, "Expired signature");

    unchecked {
      bytes32 digest = keccak256(abi.encodePacked(hex"1901", _domainSeparator,
      keccak256(abi.encode(PERMIT_TYPEHASH, owner, spender, value, _nonces[owner]++, deadline))));
      address recoveredAddress = ecrecover(digest, v, r, s);

      require(recoveredAddress != address(0) && recoveredAddress == owner, "Invalid signature");
    }

    _approve(owner, spender, value);
}
```

- Recommendation:
  - Users should be cautious when signing messages on web3 dapps to prevent unauthorized approvals with their signature.

FOUND THREATS

Informational

Owner can enable trading once.
Once enabled trading cannot be disabled again.
Trading is initially disabled.

```
function enableTrading() external onlyOwner {
    require(!_renounced.DEXRouterV2);
    require(_tradingEnabled == 0, "Already enabled");

    _tradingEnabled = _timestamp();
}
```

TRANSPARENT PROXY CONTRACT

Token Name
N/A

Symbol
N/A

Contract Address
0x12d17EA0e9F0B2239Dcf212DA9F7a4C91f92E10e

Network
Ethereum Sepolia TESTNET

Language
Solidity

Deployment Date
Dec 17, 2023

Contract Type
Proxy

Total Supply
N/A

Status
Launched

TAXES

Buy Tax
n/a

Sell Tax
n/a

Our Contract Review Process

The contract review process pays special attention to the following:

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- Mythril
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Transfer Count	TESTNET
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Total Amount	TESTNET
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Average Transfer Amount	TESTNET
First transfer date	TESTNET
Last transfer date	TESTNET
Days token transferred	TESTNET

SMART CONTRACT STATS

Calls Count	TESTNET
External calls	TESTNET
Internal calls	TESTNET
Transactions count	TESTNET
Uniq Callers	TESTNET
Days contract called	TESTNET
Last transaction time	TESTNET
Created	TESTNET
Create TX	TESTNET
Creator	TESTNET

FEATURED WALLETS

Owner address	0xBA799d418D1356ff5d225096d08951a3b45b6e4A
Current proxy implementation logic address	0xF6Eb5258748A150313F8B2E304F22646f8CB3dda
LP address	**N/A**

TOP 3 UNLOCKED WALLETS

N/A	N/A
N/A	N/A
N/A	N/A

VULNERABILITY ANALYSIS

ID	Title	
SWC-100	Function Default Visibility	**Passed**
SWC-101	Integer Overflow and Underflow	**Passed**
SWC-102	Outdated Compiler Version	**Passed**
SWC-103	Floating Pragma	**Passed**
SWC-104	Unchecked Call Return Value	**Passed**
SWC-105	Unprotected Ether Withdrawal	**Passed**
SWC-106	Unprotected SELFDESTRUCT Instruction	**Passed**
SWC-107	Reentrancy	**Passed**
SWC-108	State Variable Default Visibility	**Passed**
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SWC-117	Signature Malleability	**Passed**
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SWC-134	Message call with hardcoded gas amount	Passed
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SWC-136	Unencrypted Private Data On-Chain	Passed

FOUND THREATS

⚠ High Risk

No high risk-level threats found in this contract.

⚠ Medium Risk

No medium risk-level threats found in this contract.

⚠ Low Risk

No low risk-level threats found in this contract.

PROXY IMPLEMENTATION OF FACTORY CONTRACT

Token Name
N/A

Symbol
N/A

Contract Address
0xF6Eb5258748A150313F8B2E304F22646f8CB3dda

Network
Ethereum Sepolia TESTNET

Language
Solidity

Deployment Date
Dec 23, 2023

Contract Type
Contracts factory

Total Supply
N/A

Status
Launched

TAXES

Buy Tax
n/a

Sell Tax
n/a

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SWC-135	Code With No Effects	Passed
SWC-136	Unencrypted Private Data On-Chain	Passed

FOUND THREATS

⚠ High Risk

No high risk-level threats found in this contract.

⚠ Medium Risk

No medium risk-level threats found in this contract.

FOUND THREATS

⚠ Low Risk

Extreme caution should be taken when deploying new contract versions.
When deployed, the contract by default is not initialized and without owner.
The initialize function sets msg.sender as owner and can be called by anyone.

```
bool internal _initialized;

function initialize() external {
    require(!_initialized);

    _transferOwnership(msg.sender);
    _initialized = true;
}

function _transferOwnership(address newOwner) internal {
    address oldOwner = _owner;
    _owner = newOwner;

    emit OwnershipTransferred(oldOwner, newOwner);
}

modifier onlyOwner() virtual override {
    require(msg.sender == _owner ||
    (MULTISIGN_ADDRESS != address(0) && msg.sender == MULTISIGN_ADDRESS), "Unauthorized");
    _;
}
```

- Recommendation:
  - Always initialize the new implementation of Factory contract when assigning it to the main proxy contract to prevent hijacking.

FOUND THREATS

Informational

Owner can add credits to already existing users.

```
function addCredit(address user, uint256 amount) external onlyOwner nonReentrant {
    require(amount > 0);
    require(_userData[user].exists, "Unknown user");

    unchecked {
      _userData[user].balance += amount;
      _userData[user].addedCredit.push(addedCreditData(_timestamp(), amount, msg.sender));

      emit AddedCredit(user, amount);
    }
}
```

Owner can set/change discount levels.
Users get discounts on contract's deployment price by holding or staking $FACTORY tokens.

```
function setDiscountLevel(uint8 level, uint24 percent, uint24 discount) external onlyOwner {
    require(level < 3);

    unchecked {
      require(percent <= denominator * 100);

      if (level + 1 < 3 && _discountLevel[level + 1].exists) { require(_discountLevel[level + 1].percent > percent); }
      if (level - 1 >= 0 && _discountLevel[level - 1].exists) { require(_discountLevel[level - 1].percent < percent); }
    }

    if (!_discountLevel[level].exists) { _discountLevel[level].exists = true; }

    _discountLevel[level].percent = percent;
    _discountLevel[level].discount = discount;

    emit SetDiscountLevel(level, percent, discount);
}
```

FOUND THREATS

Informational

Owner can change multi sig and treasury addresses.

```
function setMultiSignatureWallet(address account) external onlyOwner {
    MULTISIGN_ADDRESS = account;
}

function setTreasury(address payable account) external onlyOwner {
    TREASURY_ADDRESS = account;
}
```

Owner can change factory and stake tokens.

```
function setFactoryInterfaces(address token, address stake) external onlyOwner {
    FACTORY_TOKEN = IERC20(token);
    FACTORY_STAKE = IStake(stake);
}
```

Owner can change factory and stake tokens.

```
function recoverETH(address payable to, uint256 amount) external onlyOwner {
    (bool success, ) = to.call{ value: amount }("");

    require(success);
}

function recoverERC20(address token, address to, uint256 amount) external onlyOwner {
    IERC20(token).transfer(to, amount);
}
```

FOUND THREATS

Informational

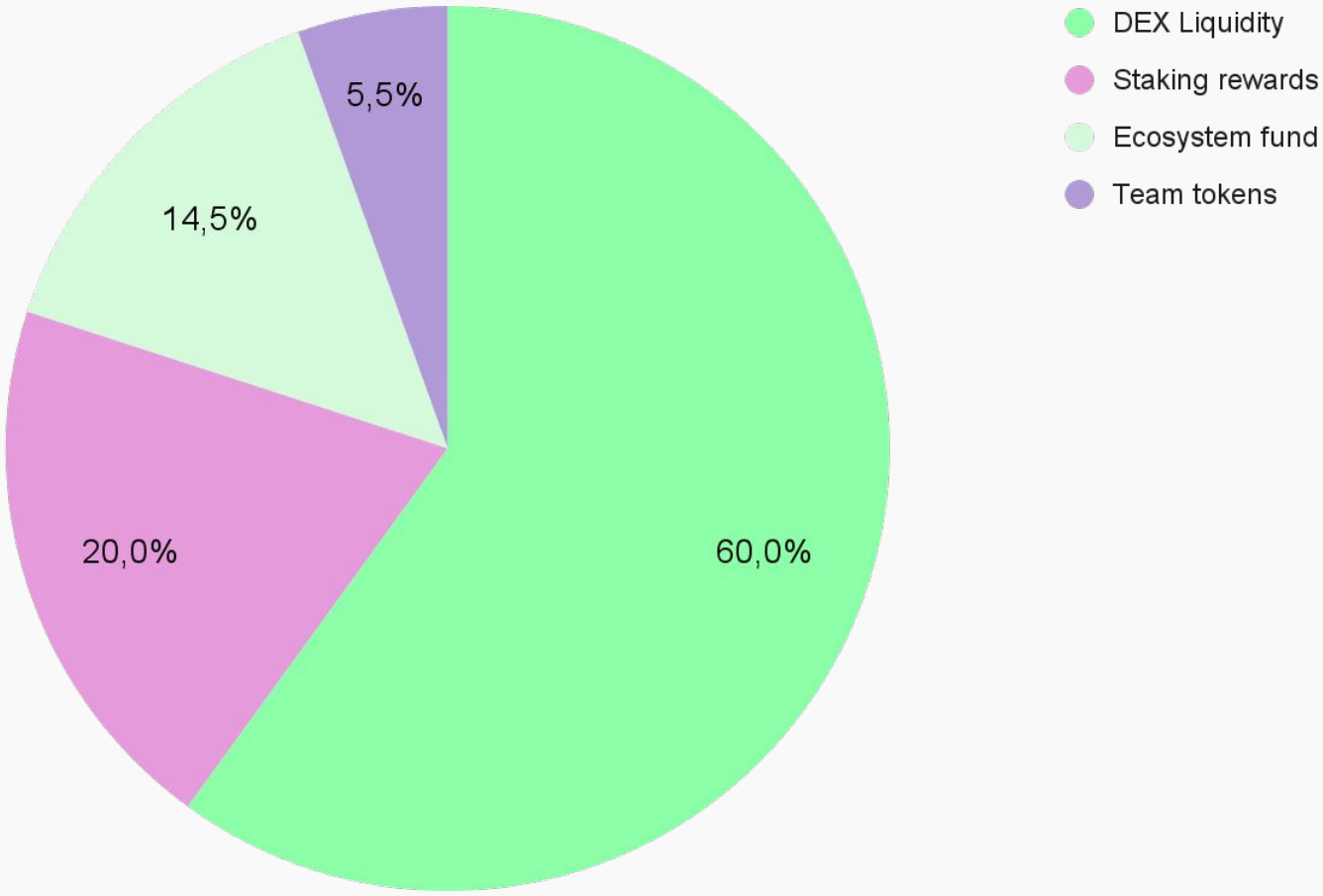
Owner can set new templates and change existing ones.

```
function setTemplate(uint256 templateId, bool active,
bool discountable, uint256[] calldata price) external onlyOwner {
    uint256 cnt = price.length;

    require(cnt > 0 && cnt < 64);

    if (!_templateData[templateId].exists) {
      _templateData[templateId].exists = true;
      _templateList.push(templateId);
    }

    _templateData[templateId].active = active;
    _templateData[templateId].discountable = discountable;

    unchecked {
      _templateData[templateId].features = cnt - 1;

      for (uint256 f; f < cnt; f++) { _templateData[templateId].price[f] = price[f]; }
    }
}
```

TOKENOMICS

The following tokenomics are based on the project's whitepaper and/or website:

- 60% - DEX Liquidity
- 20% - Staking rewards
- 14.5% - Ecosystem fund
- 5.5% - Team tokens



WEBSITE

Website URL
https://chainfactory.app/

Domain Registry
https://domains.google.com

Domain Expiration
2024-05-28

Technical SEO Test
Passed

Security Test
Passed. SSL certificate present

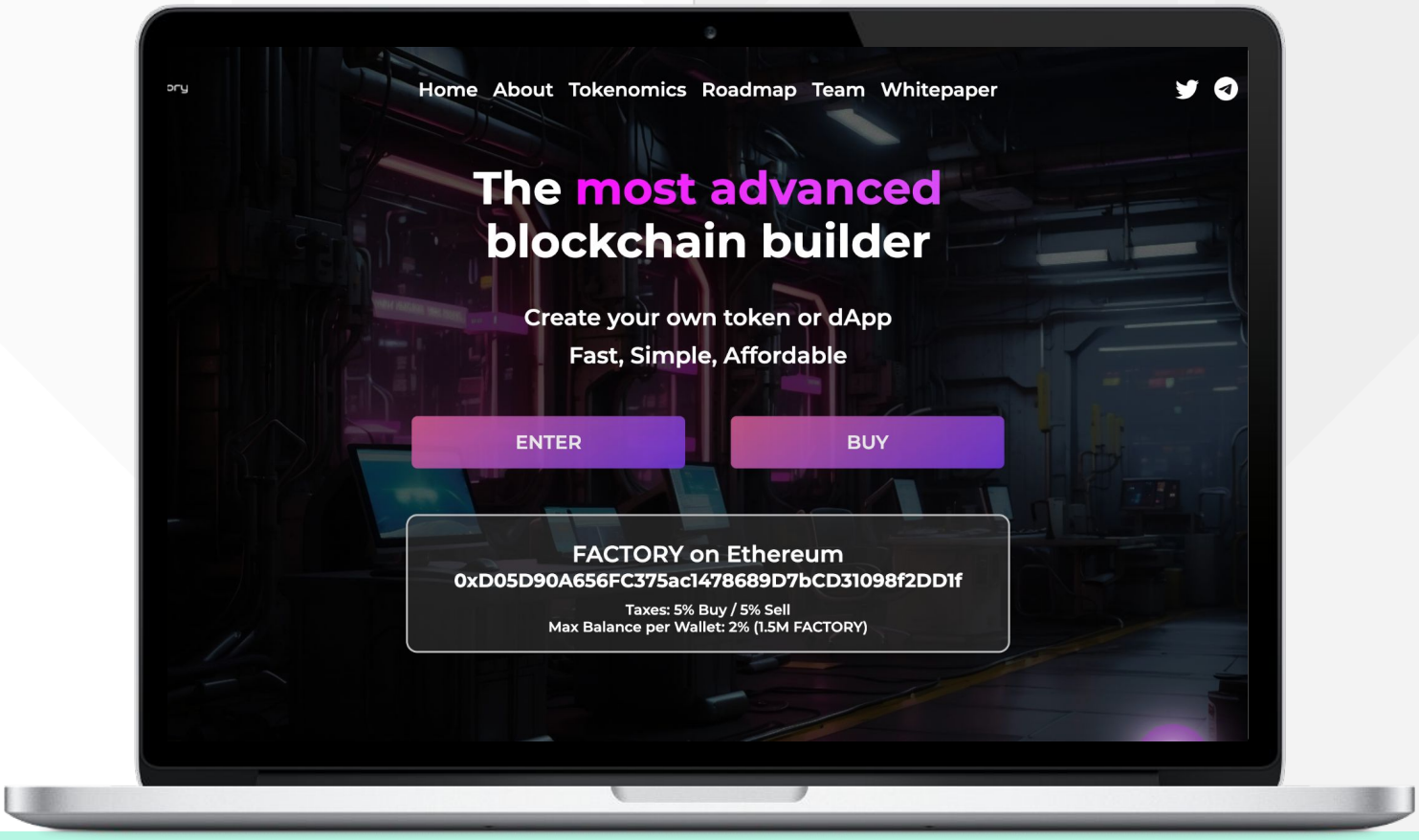
Design
Simple and intuitive web design with appropriate color scheme and graphics.

Content
The information helps new investors understand what the product does right away. No grammar mistakes found.

Whitepaper
Well written, explanatory.

Roadmap
Yes, goals set without time frames.

Mobile-friendly?
Yes



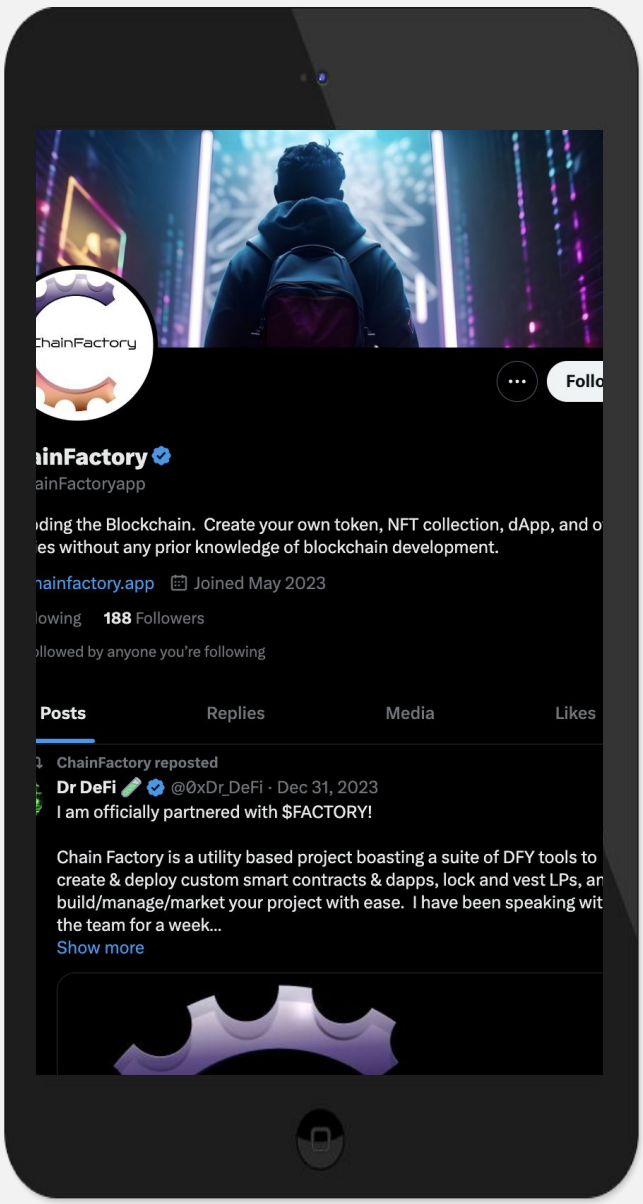
chainfactory.app

SOCIAL MEDIA

& ONLINE PRESENCE

ANALYSIS

Project's social media pages are active.



Twitter's X

@ChainFactoryApp

- 157 followers
- Posts frequently
- Active

Discord

https://discord.com/invite/4eDJf6UwP4

- 83 members
- Active members
- Active mods

Telegram

@ChainFactoryVerify

- 404 members
- Active members
- Active mods

Medium

- Not available

SPYWOLF

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Disclaimer

This report shows findings based on our limited project analysis, following good industry practice from the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, overall social media and website presence and team transparency details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report.
While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against us on the basis of what it says or doesn't say, or how we produced it, and it is important for you to conduct your own independent investigations before making any decisions. We go into more detail on this in the disclaimer below – please make sure to read it in full.

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No applications were reviewed for security. No product code has been reviewed.